this hypothesis & time: significance

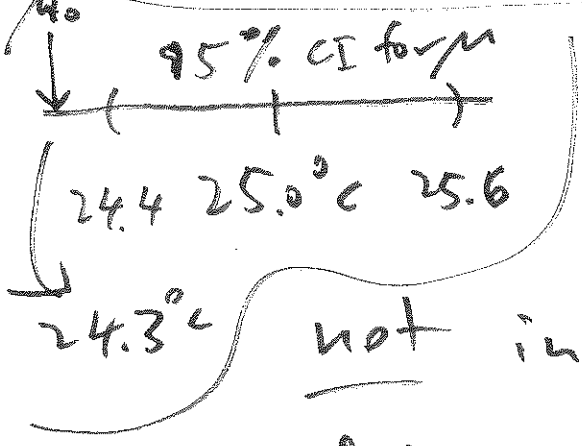
next topics; pitfalls time:

read: LN pp. L-174 → 185

AM57 19 May 2014

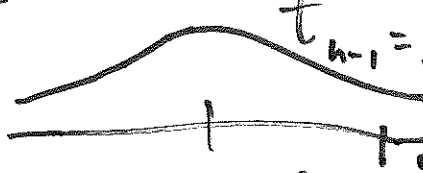
no DD office hour ① this afternoon; reschedule to next Wed 1.15 - 2.15 pm

today: LN pp. L - 162 → intertidal crabs revisited (L-139)




CI approach to inference: theory value of $\mu_0 = 24.3°C$ not in 95% CI, so theory not supported by data (at 95% confidence level)

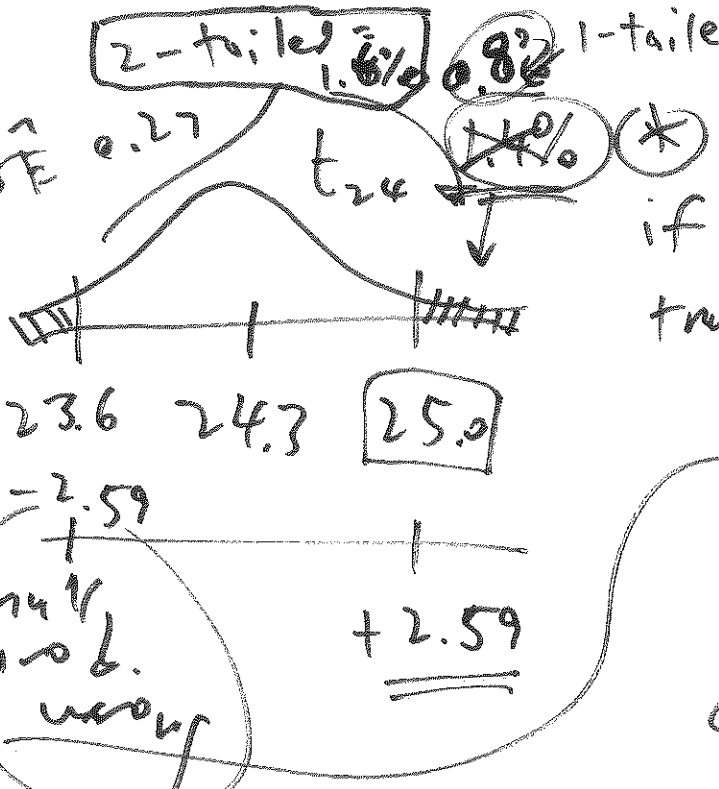
$\bar{E}$ 0.27°C




long-run hist. ⊛ of $\bar{Y}$ if null true, accounting for $\mu_0$ true uncertainty in $\sigma$

$$\frac{\text{signal}}{\text{noise}} = \frac{\bar{Y} - \mu_0}{S/\sqrt{n}} = \frac{\overbrace{25.0°C - 24.3°C}^{\text{signal}}}{\underbrace{0.27°C}_{\text{noise}}} = +2.59 = t$$

2.59 ← statistic




Fisher's idea:

if $p$ is small,

null doesn't look good ↔ favor alt.

Fisher: (2)

calculate $p$ value =

P( if null true, of getting data as extreme as, or more extreme than, what you got! )

Q: how small?

unsatisfactory A: the convention

answer: if $p \leq 5\%$, reject null

stat sig diff between $\mu_0$ & $\bar{Y}$

(100 - 95% CI)

if $p \leq 1\%$, highly stat sig (reject null)

| | |
|---|---|
| null: $\mu = \mu_0$<br>alt: $\mu \neq \mu_0$ | 2-sided alternative<br>2-tailed p value<br>(in both tails) |
| null: $\mu = \mu_0$<br>alt: $\mu > \mu_0$ | 1-sided alt $\rightarrow$<br>1-tailed p value<br>(in right tail) |
| null: $\mu = \mu_0$<br>alt: $\mu < \mu_0$ | 1 sided alt $\leftarrow$<br>1-tailed p value<br>(in left tail) |